In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended) A transmissive wire grid, full spectrum polarizer with double metal layers for use in visible spectrum, comprising:

a transparent substrate;

an array of parallel and elongated dielectric protrusions formed on the transparent substrate, wherein the dielectric protrusions have a period and a trench is located between adjacent dielectric protrusions;

a first metal layer having a first thickness formed in the trench; and

a second metal layer having a second thickness and a width formed on each dielectric protrusion, wherein the first and second metal layers are separated by a vertical distance;

wherein the period is not greater than ~~250nm~~ 180nm;

wherein the first thickness is not greater than 150nm and is equal to the second thickness;

wherein the vertical distance is not greater than 100nm;

wherein the ratio of the width to the period is in a range of 25~75%, and

wherein the full spectrum polarizer has an extinction ratio of transmittance (T_{TM}/T_{TE}) of about 1E2-3.93E5 at wavelengths between 470-610nm, where T_{TM} is the transmittance of the TM polarized light and T_{TE} is the transmittance of the TE polarized light.

2. (original) The wire grid polarizer according to claim 1, wherein the transparent substrate is exposed in the trench.

3. (original) The wire grid polarizer according to claim 1, wherein a remaining dielectric layer is formed on a bottom of the trench.

4. (previously presented) The wire grid polarizer according to claim 1, wherein a thickness of the transparent substrate is 500~1500 μm.

5. (original) The wire grid polarizer according to claim 4, wherein the transparent substrate is a glass or plastic substrate.

6. (original) The wire grid polarizer according to claim 1, wherein the dielectric layers are PMMA (polymethyl methacrylate) layers.

7. (original) The wire grid polarizer according to claim 1, wherein the first metal layer is an Au, Ag, Cu or Al layer.

8. (original) The wire grid polarizer according to claim 1, wherein the second metal layer is an Au, Ag, Cu or Al layer.

9. (original) The wire grid polarizer according to claim 1, wherein the first and second metal layers comprise the same material.

10. (original) The wire grid polarizer according to claim 1, further comprising:

a protective layer formed on the first and second metal layers.

11. (original) The wire grid polarizer according to claim 10, wherein the protective layer is a SiO_2, SiN or SiON layer.

12. (original) The wire grid polarizer according to claim 1, wherein the period is in a range of 10~250nm.

13. (original) The wire grid polarizer according to claim 1, wherein the first or second thickness is in a range of 30~150nm.

14. (original) The wire grid polarizer according to claim 1, wherein the vertical distance is in a range of 10~100nm.

15. (Currently amended) A transmissive wire grid, full spectrum polarizer with double metal layers for use in visible spectrum, comprising:

a transparent substrate;

an array of parallel and elongated dielectric protrusions formed on the transparent substrate, wherein the dielectric protrusions have a period and a trench is located between adjacent dielectric protrusions;

a first metal layer having a first thickness formed in the trench; and

a second metal layer having a second thickness and a width formed on each of the dielectric protrusions, wherein a vertical distance is between the first and second metal layers;

wherein the period is in a range of ~~10~250nm~~ 10~180nm;

wherein the first thickness is in a range of 30~150nm and is equal to the second thickness;

wherein the vertical distance is in a range of 10~100nm;

wherein the ratio of the width to the period is in a range of 25~75%, and

wherein the full spectrum polarizer has an extinction ratio of transmittance (T_{TM}/T_{TE}) of about 1E2-3.93E5 at wavelengths between 470-610nm, where T_{TM} is the transmittance of the TM polarized light and T_{TE} is the transmittance of the TE polarized light..

16. (original) The wire grid polarizer according to claim 15, wherein the transparent substrate is exposed in the trench.

17. (original) The wire grid polarizer according to claim 15, wherein a remaining dielectric layer is formed on a bottom of the trench.

18. (Currently amended) A method of forming a transmissive wire grid, full spectrum polarizer with double metal layers for use in visible spectrum, comprising the steps of:

providing a transparent substrate;

forming an array of parallel and elongated dielectric protrusions on the transparent substrate, wherein the dielectric protrusions have a period and a trench is located between adjacent dielectric protrusions;

forming a first metal layer having a first thickness in the trench; and

forming a second metal layer having a second thickness and a width on each dielectric protrusion, wherein the first and second metal layers are separated by a vertical distance;

wherein the period is in a range of ~~10~250nm~~ 1~180nm;

wherein the first thickness is in a range of 30~150nm and is equal to the second thickness;

wherein the vertical distance is in a range of 10~100nm;

wherein the ratio of the width to the period is in a range of 25~75%, and

wherein the full spectrum polarizer has an extinction ratio of transmittance (T_{TM}/T_{TE}) of about 1E2-3.93E5 at wavelengths between 470-610nm, where T_{TM} is the transmittance of the TM polarized light and T_{TE} is the transmittance of the TE polarized light..

19. (original) The method according to claim 18, the transparent substrate is exposed in the trench.

20. (original) The method according to claim 18, wherein a remaining dielectric layer is formed on a bottom of the trench.

21. (original) The method according to claim 18, further comprising the step of:

forming a protective layer on the first and second metal layers.

22. (original) The method according to claim 18, wherein the dielectric layers are formed by photolithography or nanoimprint.

23. (New) The wire grid polarizer according to claim 1, wherein the full spectrum polarizer has a transmittance T_{TM} not less than 70% over visible spectrum from 0.5μm.

24. (New) The wire grid polarizer according to claim 1, wherein each of the first metal layer and the second metal layer are formed of a single metal material.

25. (New) The wire grid polarizer according to claim 15, wherein the full spectrum polarizer has a transmittance T_{TM} not less than 70% over visible spectrum from 0.5μm.

26. (New) The wire grid polarizer according to claim 15, wherein each of the first metal layer and the second metal layer are formed of a single metal material.

27. (New) The method according to claim 18, wherein the full spectrum polarizer has a transmittance T_{TM} not less than 70% over visible spectrum from 0.5μm.

28. (New) The method according to claim 18, wherein each of the first metal layer and the second metal layer are formed of a single metal material.